

Charge for the PIP-II Machine Advisory Committee (XMAC)

February 25-27, 2014

Fermilab

In the last six months the mid-term (5-10 year) plan for the Fermilab accelerator complex has evolved to a concept known as the Proton Improvement Plan II. This concept, derived from the Project X Reference Design, calls for a ~800 MeV pulsed superconducting linear accelerator (SCL) to replace the existing 400 MeV linac. The SCL will inject into the existing booster synchrotron to allow delivery of 1.2 MW of beam power from the Main Injector (at 120 GeV) for a long baseline neutrino experimental program.

The XMAC is asked to review the plans for PIP-II, including the design concept, the R&D plan, the project cost and schedule and the plan to prepare for construction.

Advice and/or recommendations are sought relative to the viability of the design concept and the appropriateness of the accompanying R&D strategy. In particular we would like specific advice, recommendations, and/or commentary on:

1. **Design Concept:** Does the PIP-II conceptual design represent a viable concept for a high intensity proton facility meeting the enumerated performance goals?
2. **Risks:** Have the primary areas of technical and cost risk associated with the design concept been identified?
3. **R&D Plan:** Is the R&D plan properly directed at addressing the identified risks in an effective manner? Are the risks appropriately prioritized and will the completion of the R&D plan provide a basis for proceeding to the construction phase with confidence that performance goals can be met?
4. **Plan to prepare for construction:** To what extent are the deliverables of the R&D plan necessary to complete prior to construction? Can or should some elements of the plan be carried out in the construction phase? If available resources do not support the complete pre-construction plan, which elements should be considered highest priority for available funding?

The XMAC is not limited by these specific charge areas and may delve into other related areas, and offer advice, comment, or recommendations, as it deems appropriate under the general guidance of this charge. We request an oral closeout presentation by the XMAC with Fermilab management, the PIP-II Collaboration, and DOE observer(s) at the end of the meeting. A written report is requested to be submitted to the Fermilab Director by March 14, 2014.